Potential Mission Scenarios Post Asteroid Crewed Mission

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A deep-space mission has been proposed to identify and redirect an asteroid to a distant retrograde orbit around the moon, and explore it by sending a crew using the Space Launch System and the Orion spacecraft. The Asteroid Redirect Crewed Mission (ARCM), which represents the third segment of the Asteroid Redirect Mission (ARM), could be performed on EM-3 or EM-4 depending on asteroid return date.

Recent NASA studies have raised questions on how we could progress from current Human Space Flight (HSF) efforts to longer term human exploration of Mars. This paper will describe the benefits of execution of the ARM as the initial stepping stone towards Mars exploration, and how the capabilities required to send humans to Mars could be built upon those developed for the asteroid mission. A series of potential interim missions aimed at developing such capabilities will be described, and the feasibility of such mission manifest will be discussed. Options for the asteroid crewed mission will also be addressed, including crew size and mission duration.

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